| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| | SIG-1 |

# GENERAL CONSTRUCTION NOTES:

INSTALLATION AND CONSTRUCTION SHALL CONFORM TO THE STATE DEPARTMENT OF TRANSPORTATION STANDARDS SPECIFICATIONS SECTIONS APPLICABLE AND STANDARD PLANS DATED AND EFFECTIVE FOR THE CURRENT YEAR AND ANY SPECIAL MUNICIPALITY CODE PROVISIONS.

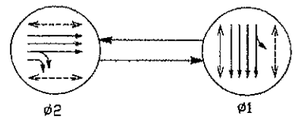
1. THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES IS APPROXIMATE. THE SUBCONTRACTOR SHALL DETERMINE THE LOCATION AND DEPTH OF ALL UTILITIES INCLUDING THOSE NOT SHOWN ON PLANS AND VERIFY ALL JOBSITE CONDITIONS, HAND EXCAVATE FOUNDATION UNTIL CLEAR OF ALL SUBSTRUCTURES AND PROTECT ALL FACILITIES DURING CONSTRUCTION. SUBCONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS FOR UNDERGROUND UTILITY REMOVAL OR LOCATION WITH RESPECTIVE UTILITY OWNERS AS MAY BE REQUIRED SUFFICIENTLY IN ADVANCE TO PREVENT DELAY IN OPERATIONS.
2. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO UNDERGROUND UTILITIES ENCOUNTERED IN AREAS WHERE EXCAVATIONS ARE INDICATED AND SHALL REPAIR ANY SUCH DAMAGE AT OWN EXPENSE. WHERE UTILITY LINES MUST BE MAINTAINED UNDER STRUCTURE, THEY SHALL BE PROPERLY SLEEVED THROUGH FOUNDATION.
3. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OR REPAIR OF ANY DAMAGE CAUSED BY THEM OR THEIR SUBCONTRACTORS.
4. THE SUBCONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND NOTIFY ALL UTILITIES AND THE CITY AT LEAST 72 HOURS IN ADVANCE OF CONSTRUCTION.
5. THE SUBCONTRACTOR IS REQUIRED AND MUST SUBMIT A WEEKLY SCHEDULE PRIOR TO START OF WORK EACH WEEK. (NO EXCEPTIONS).
6. POLE DETECTOR AND EQUIPMENT LOCATIONS SHALL BE AS DEPICTED ON SITE PLAN. THE SUBCONTRACTOR SHALL VERIFY EQUIPMENT FIELD LOCATIONS WITH THE CITY TRAFFIC ENGINEER OR LOCAL AND/OR EXCAVATION AUTHORITY AS PRIOR TO INSTALLATION.
7. THE SUBCONTRACTOR SHALL SUPPLY AND INSTALL ALL CONDUCTORS NECESSARY FOR THE INTENDED OPERATION AS NOTED ON THESE PLANS, NEC AND ALL APPLICABLE MUNICIPALITY CODES.
8. PROVIDE ANCHOR BOLT NUT COVERS FOR ALL STANDARDS.
9. ALL PULLBOXES AND COVERS SHALL BE CONCRETE OR PVC AS REQUIRED BY THE MUNICIPALITY. ALL PULLBOXES SHALL BE NO. 5 UNLESS OTHERWISE NOTED OR REQUIRED BY THE MUNICIPALITY.
10. ALL CONCRETE FORMS ARE TO BE INSPECTED BY LOCAL AUTHORITIES BEFORE CONCRETE IS PLACED.
11. THE SUBCONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES DURING TRAFFIC SIGNAL INSTALLATION.
12. INDUCTIVE LOOPS SHALL BE 40' x 80' OR APPLICABLE (SEE DETAIL IN THE TECHNICAL SPECIFICATIONS) WITH FOUR (4) TURNS, UNLESS OTHERWISE SPECIFIED ON PLAN, OF IMSA SPECIFICATION 51-5 XLPE APPROVED LOOP DETECTOR WIRE AND BLASTOMERIC SEALANT, PER LOCAL CODE. THE LEAD IN RUNS WILL BE INSTALLED WITH FIVE (5) TURNS PER FOOT INTO THE STUBOUT PER CITY AND DOT STANDARDS. ALL DLC'S SHALL MEET IMSA SPECIFICATION 50-2. ALL CONDUITS SHALL BE PVC, 2" MINIMUM INSIDE DIAMETER, UNLESS OTHERWISE SPECIFIED ON PLAN.
13. THERE SHALL BE A MINIMUM OF 36" BETWEEN EXISTING LOOPS AND PROPOSED INDUCTIVE LOOPS.
14. INDUCTIVE LOOP CABLE INTO NEW NO. 5 PULLBOX SHALL BE THROUGH 2" MINIMUM PVC CONDUIT SPACED 8" APART TO ISOLATE THE SIGNALING AND PREVENT INTERFERENCE.
15. ALL CUT LINES SHALL HAVE A MINIMUM SPACING OF 12".
16. ALL INDUCTIVE LOOPS AND CUT LINES SHALL BE PLACED A MINIMUM OF 40' FROM ANY METAL COVERS AND/OR GRATING IN ROAD SURFACES.
17. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING AND COORDINATION WITH THE SERVING (ELECTRICAL) UTILITY COMPANY AND PAY REQUIRED FEES FOR SERVICE CONNECTIONS.
18. THE SUBCONTRACTOR TO OBTAIN A NO FEE ENCROACHMENT PERMIT FROM THE CITY PRIOR TO COMMENCEMENT OF WORK. ALL WORK SHALL BE INSPECTED BY CITY FORCES. AT COMPLETION OF PROJECT CONTACT THE CITY TRAFFIC ENGINEER 24 HOURS PRIOR TO COMPLETION OF WORK.
19. THE SUBCONTRACTOR IS TO BUILD AND MAINTAIN A CONSTRUCTION BARRICADE (ALS, NECESSARY LIGHTS, SIGNS, ETC. IF REQUIRED) FOR PROTECTION OF THE PUBLIC AS DIRECTED BY THE LOCAL AUTHORITIES.
20. ALL SUBCONTRACTORS TO PROVIDE LIABILITY INSURANCE AND WORKERS COMPENSATION BENEFITS IN ACCORDANCE WITH STATE LAW FOR ALL WORKERS AND AGENTS WHO WILL BE ON THE SITE AT ANY TIME WHILE PERFORMING WORK ON THIS PROJECT.
21. ALL WORK SHALL BE IN ACCORDANCE WITH NEC, ALL LOCAL, STATE AND FEDERAL CODES, ORDINANCES AND ANY APPLICABLE AMENDMENTS.
22. ALL DEBRIS, EXCESS MATERIAL, ETC. IS TO BE REMOVED BY THE SUBCONTRACTOR BY THE END OF THE JOB. JOB TO BE LEFT SUFFICIENTLY CLEAN AS TO WARRANT CITY APPROVAL.
23 THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS, FEES AND INSPECTIONS AS MAY BE REQUIRED FOR COMPLETION OF THE JOB AS PER ALL GOVERNING AGENCIES.
24. THE SUBCONTRACTOR TO PROVIDE COST ESTIMATE FOR ALL WORK SHOWN ON DRAWINGS AND WORK NORMALLY REQUIRED TO CARRY OUT THE DESIGN INTENT OF THESE DRAWINGS.
25. DRAWINGS ARE NOT TO BE SCALED, WORK SHALL BE GOVERNED BY DIMENSION ONLY. DISCREPANCIES BETWEEN THE DRAWINGS AND/OR THE EXISTING SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF ACS IMMEDIATELY.
26. RLC EQUIPMENT SHALL NOT BE INSTALLED ON MEDIANS LESS THAN FIVE FEET (5) IN WIDTH.
27. RLC RELATED EQUIPMENT SHALL NOT BE INSTALLED WITHIN FIVE FEET (5') OF FIRE HYDRANT.
28. RLC RELATED EQUIPMENT SHALL NOT BE INSTALLED WITHIN FOUR FEET (4') OF ADA RAMPS.
29. SUBCONTRACTOR SHALL SUPPLY AS-BUILT DRAWINGS TO ACS ENGINEERING DEPARTMENT WITHIN THIRTY (30) DAYS OF CONSTRUCTION COMPLETION.
30. SUBCONTRACTOR SHALL COMPLETE A "RLC POST CONSTRUCTION INSTALLATION ACCEPTANCE FORM" FOR EACH RLC INSTALLED. COMPLETED FORMS SHALL BE FORWARDED TO ACS CONSTRUCTION DEPARTMENT.
31. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE RESPECTIVE OWNERS AND OTHER AGENCIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
CONTACT:

* GAS COMPANY
* WATER DISTRICT
* PRIME COMPANY
* CABLE COMPANY
* LOCAL ARMOR STATE EXCAVATION AUTHORITY

## SPECIFIC CONSTRUCTION NOTES:

1. THE SUBCONTRACTOR SHALL INSTALL ALL SUBSTRUCTURES ACCORDING TO LOCAL GOVERNING AGENCY FROST LINE REQUIREMENTS WHERE APPLICABLE.
2. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING PHOTO ENFORCEMENT SIGNAGE PER CITY STANDARDS.
3. THE SUBCONTRACTOR SHALL SUPPLY AND INSTALL "TRANSPO, INC." BREAKAWAY BOLTS ONTO 1" ABPS. THREADED BOLT SHALL NOT PROTRUDE MORE THAN 2-1/2" ABOVE FINISHED CONCRETE SURFACE.
4. PULLBOX COVERS SHALL HAVE MARKING "TRAFFIC SIGNAL".

## PHASING DIAGRAM




PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

## TABLE OF OPERATION

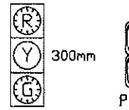
| SIGNAL FACE | PHASE ø1 | PHASE ø2 | FLASH |
|---|---|---|---|
| 11,12,13 | G | R | R |
| 21,22,23 | R | G | Y |
| P11,P12 | W | DW | DRK |
| P13,P14 | W | DW | DRK |
| P21,P22 | DW | W | DRK |
| P23,P24 | DW | W | DRK |

## TIMING CHART
NEMA TS-1 SINGLE RING CONTROLLER

| PHASE | ø1 | ø2 |
|---|---|---|
| MINIMUM GREEN | 7 SEC. | 7 SEC. |
| PASSAGE/GAP | 0.0 SEC. | 0.0 SEC. |
| YELLOW CHANGE INT. | 4.0 SEC. | 4.0 SEC. |
| RED CLEARANCE | 2.0 SEC. | 2.0 SEC. |
| MAX. 1 | 45 SEC. | 45 SEC. |
| RECALL POSITION | MAX. /PED. | MAX. /PED. |
| VEH. CALL MEMORY | N/A | N/A |
| WALK | 7 SEC. | 7 SEC. |
| FLSHG DON'T WALK | 9 SEC. | 9 SEC. |

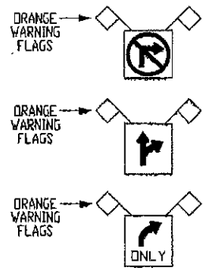
## SIGNAL FACE I.D.

Denotes L.E.D.




## NOTES

1. REPOSITION EXISTING SIGNAL HEADS NUMBERED 21 AND 22.
2. MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERSEDE THESE VALUES.
3. THIRTY DAYS AFTER IMPLEMENTATION OF THE REVISED SIGNAL OPERATION, SIGNS Ⓒ, Ⓓ AND Ⓔ AND/OR ORANGE FLAGS MAY BE REMOVED AT THE DISCRETION OF THE AREA TRAFFIC ENGINEER.



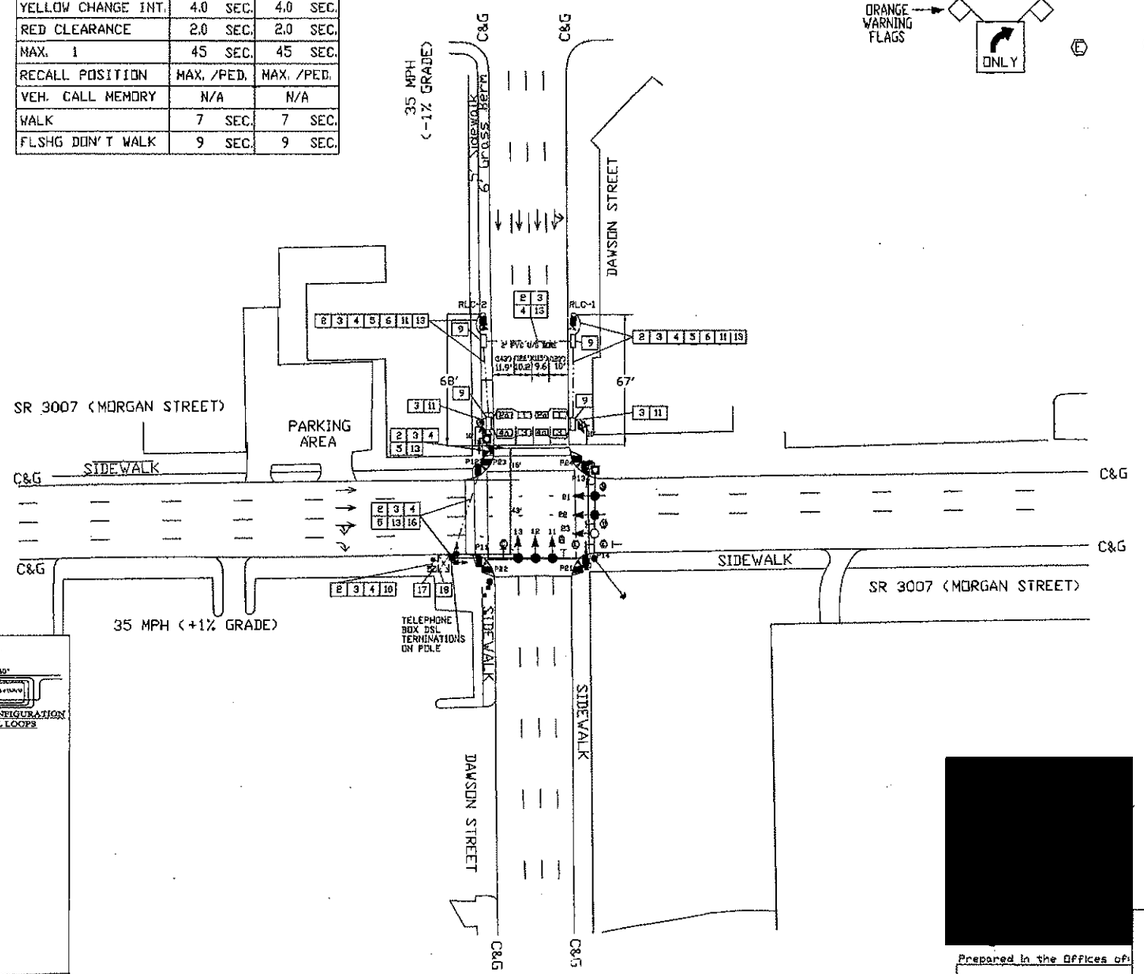

| | | |
|---|---|---|
| Ⓒ | No Right Turn Sign With Flags (R3-1) | N/A |
| Ⓓ | Combined Through and Right Arrow Sign With Flags (R3-6R) | N/A |
| Ⓔ | Right Arrow 'ONLY' Sign With Flags (R3-5R) | N/A |

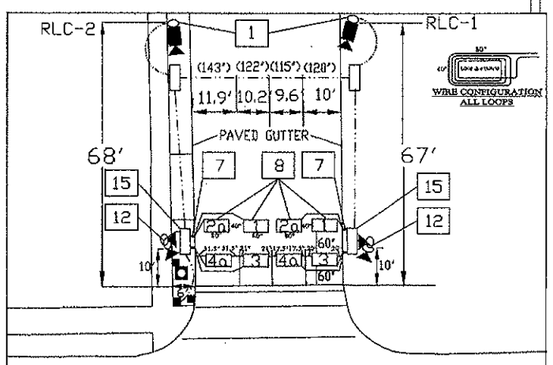
# 2 PHASE PRETIMED
(RALEIGH CITY SIGNAL SYSTEM)

## LEGEND

| PROPOSED | | EXISTING |
|---|---|---|
| | Traffic Signal Head | |
| | Sign | |
| | Pedestrian Signal Head | |
| | Signal Pole with Guy | |
| | Signal Pole with Sidewalk Guy | |
| | Inductive Loop Detector | |
| | Controller & Cabinet | |
| | Pull Box | |
| | 50mm Underground Conduit | |
| | Right of Way with Marker | |
| | Directional Arrow | |
| | Pavement Marking Arrow | |
| N/A | Wheelchair Ramp | |
| | Metal Strain Pole | |
| N/A | Combined Through and Left Arrow Sign (R3-6L) | Ⓐ |
| N/A | No Left Turn Sign (R3-2) | Ⓑ |

VIDEO DETECTION CAMERA
MODEL 450 ASSEMBLY
AUXILIARY FLASH ASSEMBLY
NO. 5 PULLBOX
POWER PEDESTAL




RLC ARM ORIENTATIONS: SHOOTS OVER ITSELF

SB LOOP DETECTION DETAIL
EXPLODED DETAIL NOT TO SCALE

## CONSTRUCTION LEGEND:

1. ACS TO PROVIDE POLE CAMERA UNIT. SUBCONTRACTOR TO PROVIDE 2' X 2' X 60' PCC FOUNDATION. SUBCONTRACTOR SHALL INSTALL 4' CAP AT LEAST 30' WIDE. POLES SHALL BE 36' MIN. FROM CURB FACE UNLESS OTHERWISE NOTED ON DRAWING.
2. INSTALL 3 # 10 THW CABLING FOR 120 Vac POWER, COLOR CODE BLACK, WHITE & GREEN.
3. INSTALL 2' PVC CONDUIT PER CITY SPECIFICATIONS, STUB INTO NEW OR EXISITING PULL BOX.
4. CONNECT 3 WIRE CIRCUIT TO POWER PEDESTAL ON SEPERATE 20 AMP CIRCUIT BREAKER FOR 120 Vac POWER
5. INSTALL 9 CONDUCTOR # 14 SHIELDED CABLE FOR 120 Vac RED AND YELLOW PHASE CONTROL. ROUTE FROM RLC CAMERA TO TRAFFIC SIGNAL CONTROLLER CABINET. REFER TO CR 9321 MAGNETIC MODULE WIRING DETAIL ON SHEET 2.
6. INSTALL (4) 2 CONDUCTOR SHIELDED DLC'S WITH DRAIN WIRE, IMSA 50-2, 12 AWG CABLING TO EACH ACS POLE, (4 EACH CABINET)
7. INSTALL LOOP STUB OUT TO PULL BOX. EACH LOOP LEAD WIRE SHALL BE CUT IN SEPERATE CHANNELS TO STUB OUT.
8. INSTALL (4) LOOP DETECTORS, IMSA 51-7, 14 AWG CABLING.
9. INSTALL NEW PULL BOX. ALL PULL BOXES SHALL BE NO. 5 UNLESS OTHERWISE NOTED ON DRAWING.
10. INSTALL IN-LINE FUSE HOLDERS RATED AT 20 AMPS FOR POWER. INSTALL IN-LINE FUSE HOLDERS RATED AT 5 AMPS FOR PHASE CONDUCTORS.
11. INSTALL 3 PAIR # 14 THW FOR AUXILIARY FLASH POWER AND TRIGGERING FOR EACH AUXILIARY FLASH UNIT.
12. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING AUXILIARY FLASH UNITS ~ 12' ABOVE SIDEWALK SEE SHEET 2 AUX FLASH DIAGRAMS
13. INSTALL 3 PAIR IMSA 59-2, # 22 AWG FOR RLC ROUTER INTERFACE CABLE. ROUTE FROM TELEPHONE JUNCTION BOX TO EACH RLC POLE.
14. N/A
15. SPLICE & SOLDER LOOP DETECTOR LEAD INS TO RLC CABLES AND INSTALL 3M COUPLERS OR EQUIVALENT IN THE PULL BOX.
16. TELEPHONE DSL / ISDN TERMINATIONS.
17. INSTALL POWER PEDESTAL TO DOT SPECIFICATIONS PEDESTAL LOCATION TO BE DETERMINED BY SERVICE PLANNER
18. INSTALL CR 9321 MAGNETIC MODULE AT TRAFFIC SIGNAL CONTROLLER CABINET. SEE CR 9321 WIRING DETAIL ON SHEET 2.

[redacted]

Prepared in the Offices of:
Ramey Kemp & Associates, Inc.
Transportation Engineers

STATE OF NORTH CAROLINA — DEPARTMENT OF TRANSPORTATION — Traffic Engineering and Safety Systems Branch — Signals and Geometrics Section

ACS STATE AND LOCAL SOLUTIONS
PUBLIC SAFETY SOLUTIONS

RED LIGHT PHOTO ENFORCEMENT PLAN
CITY OF RALEIGH
SB DAWSON STREET @ MORGAN STREET

SHEET 1 OF 2

SCALE 1" = 40'

US 70-401/NC 50 (Dawson St)
at
SR 3007 (Morgan St)

| | | |
|---|---|---|
| DIVISION 5 | WAKE COUNTY | RALEIGH |
| PLAN DATED: 7/25/03 | REVIEWED BY: [redacted] | |
| PREPARED BY: [redacted] | RKA PROJ NO: 03060 (041) | |

| REVISIONS | INIT. | DATE |
|---|---|---|
| | | |

SEAL [redacted]

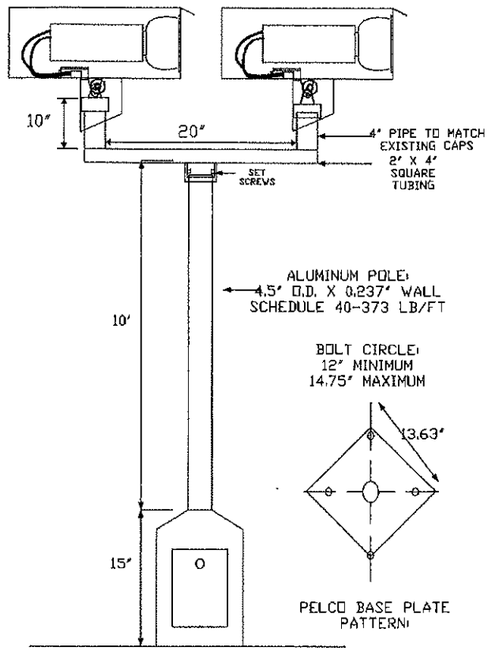
SIGNATURE _____ DATE _____

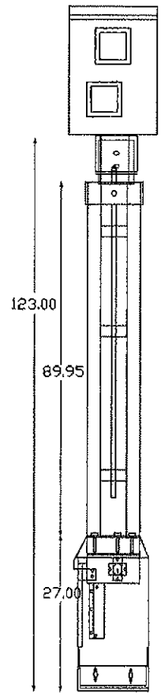
SIG. INVENTORY NO: 05-0096

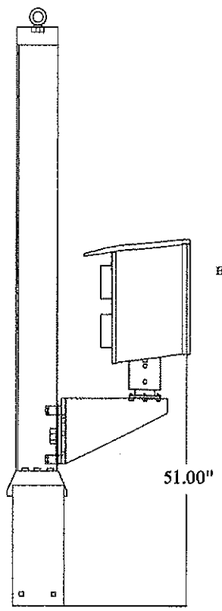
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| | 2 |

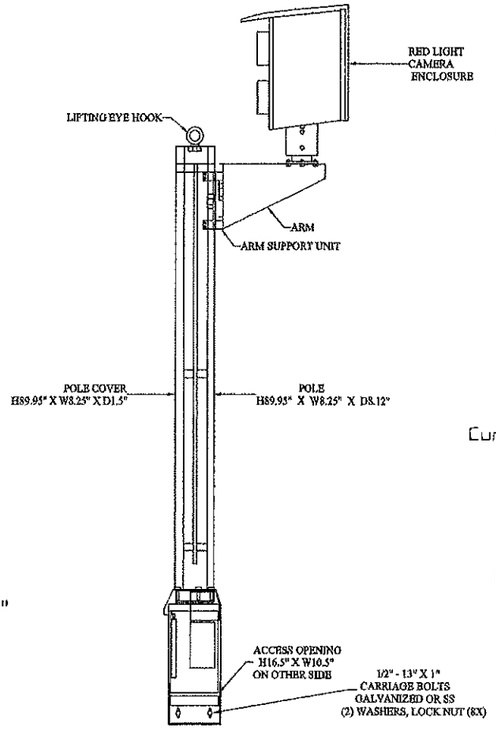
## FREE STANDING PELCO POLE

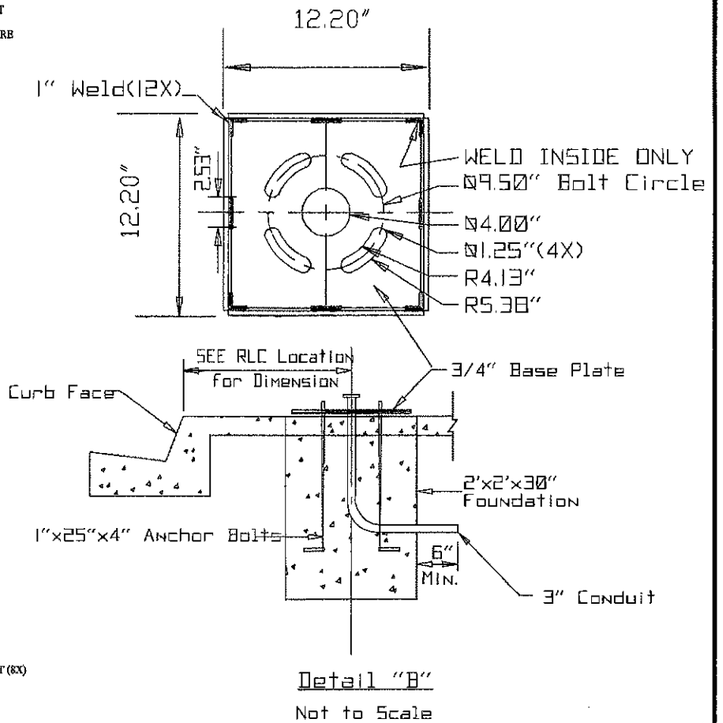
DUAL AUX ARMS MANUFACTURED IN ALUMINUM



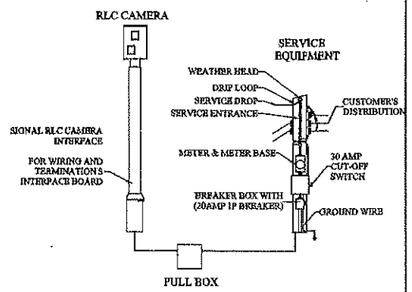




Detail "B"

Not to Scale

MODEL 450
MOTORIZED POLE DETAIL

## SINGLE LINE DRAWING




1. The pole diameter shall be at least six (6) inches at its smallest dimension. The setting depth shall be five (5) feet minimum for poles thirty (30) feet tall or less. Poles between thirty (30) and fifty (50) feet tall shall have a setting depth of seven (7) feet. Contact the company for the setting depths of poles taller than (50) feet.

2. The height of the pole must be such that minimum required clearance for company and customer conductors are maintained.

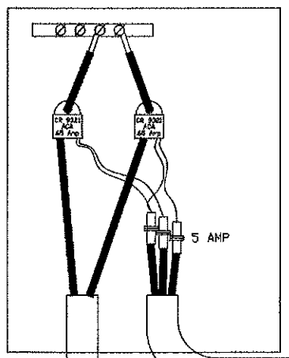
3. The customer owned pole must be approved by the company prior to upgrading service.

4. Service entrance conductors where entering and exiting the meter base shall have watertight connectors.

5. The center of the meter shall be no lower than four (4) feet or higher than six (6) feet (5 feet preferred) above final grade or final grade of the traveled surface.

6. A clear space shall be maintained.

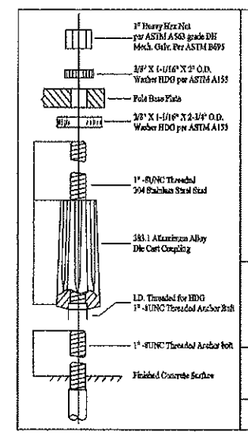
## CR 9321 MAGNETIC MODULE WIRING DEATAIL




CR MAGNETICS: MODEL NUMBER CR 9321-ACA-0.65
THESE MODULES ARE CURRENT SWITCHES THAT ARE 100% NON INVASIVE. THEY ARE CONFIGURED NORMALLY OPEN AND ENABLED WHEN THE PHASE CURRENT PASSED THROUGH THE OPENING IS AT OR EXCEEDS 650 MILLI AMPS.

WHEN THE MODULE IS ACTIVATED, 120Vac HOT IS PASSED TO THE PHASE INPUTS OF THE RLC/GTC-D UNITS.

FROM THE RLC POLE, RUN 3 CONDUCTORS TO THE TRAFFIC CONTROLLER CABINET.
1) 120Vac HOT
2) RED PHASE INPUT
3) AMBER PHASE INPUT
4) 5 AMP IN-LINE PHASE FUSES




**SPECIFICATION**

Breakaway Support Couplings (longitudinally grooved) conforms to AASHTO 1985 standards for breakaway supports for light poles and approved by FHWA for use on Federal Aid projects.

Tensile strength 24.0 kips min.
Ultimate shear 3.6 kips min., 6.5 kips max.
Net torque 175 ± 25 ft. lbs.
*Torque control nut should not be used in highly corrosive environment.

Coupling coating: Hot-dip galvanized per ASTM A153
Anchor Bolt: Weathering per MIL Std. TTC-450 method 3 type 2, polyamide epoxy electrostatic coat finish hard coat with black nylon #11, 7-15 mil thick.
Internal Threads: Dry film Lubricant per MIL-L-23398
1" -8 UNC per ASTM 153, 2-1/2" - 3" above foundation. (Supplied by others)

Installation note: Coupling is installed 1/8" min. to 3/8" max. off the anchor foundation and provides for leveling. (See installation instructions).

**INTENDED USE**

The breakaway support coupling is used with base plate equipped poles installed in locations exposed to vehicular collisions, on 1" diameter HDG anchor bolts.

BREAKAWAY SUPPORT COUPLINGS FOR LIGHT POLES FOR USE WITH 1" DIAMETER HDG ANCHOR BOLT
Model No. 201

pole-safe® BY TRANSPO®

Signal Revision

Prepared in the Offices of

Ramey Kemp & Associates, Inc.

ACS STATE AND LOCAL SOLUTIONS
PUBLIC SAFETY SOLUTIONS

RED LIGHT PHOTO ENFORCEMENT PLAN

CITY OF RALEIGH
SB DAWSON @ MORGAN ST

SHEET 2 OF 2

122 N. McDowell St., Raleigh, NC 27603

SCALE: NONE

US 70-401/NC 50 (Dawson Street) at SR 3007 (Morgan Street)

Division 05 | Wake County | Raleigh

PLAN DATE: 7-25-03 | REVIEWED BY: [redacted]

PREPARED BY: [redacted] | RKA PROJ. NO: 03050 (041)

| REVISIONS | INIT. | DATE |
|---|---|---|

SEAL [redacted]

SIGNATURE | DATE

STD. INVENTORY NO. 05-0096